DOCUMENT RESUME

ED 229 159 PS 013 518

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TITLE Children's Strategies in Interpersonal and Task Situations.
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SPONS AGENCY Administration for Children, Youth, and Families (DHHS), Washington, D.C.
PUB DATE Apr 83
CONTRACT HHS-105-81-C-006
NOTE 14p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Detroit, MI, April 21-24, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Behavior Rating Scales; *Children; *Cognitive Processes; *Performance Tests; *Test Construction
IDENTIFIERS Animal Stalls Task; Childrens Strategies Assessment System; *Social Interaction

ABSTRACT

An approach to studying children's strategies in social interactions and in material tasks has been developed for use with children 3 through 6 years of age. The Children's Strategies Assessment System (CSAS) provides both a time and an event sample of behaviors and records children's strategies under each of five constructs: involvement, planning, monitoring, accommodation, and outcome. In addition, social strategies are differentiated from strategies with objects, or "mastery" activities. To assess task strategies, a structured task called "Animal Stalls" has been developed. Basically, the Animal Stalls task requests the child to reproduce a model block construction. There are two-, three-, and six-stall models with progressively complex arches for children aged 3 to 6. The Animal Stalls block construction task was administered to 75 children from public and private preschools and public kindergartens. The outcome of the construction process was analyzed to yield a Completion Success Index; protocols were sorted into five categories based on reproduction accuracy. Children's classroom teachers assessed subjects' general competence in social situations and on school-related tasks. A similar study in progress observes a sample of forty-five 4-year-olds and young 5-year-olds in both the classroom and on the Animal Stalls Task; teachers' ratings of the children's competence in social and school-related mastery competence are also being collected. Results of the first study and preliminary findings of the second study are discussed. (RH)

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Children's Strategies in Interpersonal and Task Situations

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We have been developing an approach to studying children's strategies in social interactions and in material tasks. The focus is on assessing children's competence in everyday situations. The system we have developed, the Children's Strategies Assessment System (CSAS), is designed for use with children aged three through six in the natural setting of the preschool and primary school classroom, or in an individual session where a child is given a task or standard measure.

The term strategies seems much in use these days, and different researchers give it rather different meanings. Let us first say something about what we mean by the concept of strategies.

Strategies are actions. A strategy is a means to an end--the manifestation, in action, of an instrumental intent. It is therefore purposeful and, to be effective, fits the context. Strategies are used by children (and adults) in everyday situations to organize knowledge and action. The concept of strategies highlights the child's ability to draw on his or her knowledge and capabilities and to use them in specific situations. The concept is closely allied to that of competence, of knowing how rather than simply knowing that. The focus, therefore, is on using one's knowledge in functionally appropriate ways (see also, Lee, 1979).

In general, researchers have asked what strategies children of different ages use in a particular task or situation. Specific, observable strategies have been distinguished, usually tied to the particular task or context of interest--visual

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[1]This paper was presented at the biennial meetings of the Society for Research in Child Development in Detroit, April 1983. The work reported here was part of a project funded by the Administration for Children, Youth and Families, U.S. Department of Health and Human Services, Contract #HHS-105-81-C-006. Additional support was given by Bank Street College of Education. We want to acknowledge the valuable contributions of Lucia Desir, Barbara D. Goodson, and Judith D. Singer.

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PS013518

scanning (Vurpillot, 1968), memory (Istomina, 1975), construction (e.g., Forman, 1982; Goodson, 1982), or aspects of peer relationships (e.g., Forbes, Katz, Paul and Lubin, 1982; Putallaz and Gottman, 1981). The definition of a specific strategy, how it develops, and how it is used will vary depending on the task. Any given task or situation offers definable opportunities for the child to manifest certain kinds of strategies.

Past research also makes it clear that it is important to clarify the role of ontogenetic change and development in the child's use of strategies. Some strategies that are intentional for a younger or less experienced child become routinized or ritualized; in addition, less effective strategies may be discarded and replaced by more effective ones.

In our effort to specify the concept of strategies, information processing theory has provided a useful formulation. In this approach, cognition or knowing is considered to be largely "knowing how;" there is an emphasis on process rather than on information. The system for observing children, the Children's Strategies Assessment System, or CSAS, which we have developed takes account of the child's behavior in social interactions and in task related activities. We have drawn on Bronson's (1978, 1982) concept of executive skills, which includes both social and nonsocial behavior and, like strategies, is integrative. The Executive Skills Profile was designed for use in the classroom, and focuses on social behavior, mastery behavior, and the child's use of time. It has been used with several hundred children, from two to seven, and serves as the basis for the CSAS.

We also use the CSAS to observe strategic behavior in a prestructured task where the child is working in an individual session.

The goals of this study are:

1. to develop an system for observing children's strategic behavior
    a. in spontaneous social interaction and in situations requiring mastery in the classroom setting
    b. in a structured task, and

2. to compare children's use of strategies in social and task situations in the classroom, as well as their use of task-related strategies in the classroom context and in the more constrained structured situation.

The Observation System

The CSAS provides both a time and event sample of the behaviors recorded. Time is recorded in 15-second intervals. Observations are scheduled at times when children are free to work together or by themselves. We do not try to cover the entire range of possible interactions and settings, both focus on those in which the child interacts with others, or undertakes a task that has a recognizable and observable goal. This is not to suggest that all purposeful activity has an observable outcome. But if it is not clear what a child is trying to do, the relationship between strategies used and the estimate of success in completing the task is obscure. It is important to link the use of particular strategies with outcome, and to determine what kinds of strategies are associated with more and less effective performance (or, to put it another way, to link process and product).

The constructs and strategies.

Our model of strategic behavior generates the following five major constructs from which specific observable behaviors have been derived. These are,

Involvement, the nature of the child's absorption in an activity, is a function of the motivation and affect (the needs, desires, and impulses) that lead to action.

Planning means looking ahead, working out what is needed and what to do next in connection with some activity. Planning has to do with how the child manages, organizes and anticipates his actions and those of others. It is assumed that planning, however rapid, is a prerequisite to action. It may be directly observable, as when a child verbalizes a plan, or it may be inferred from the organization of actions, as when a child prepares a space for an activity. Thus, planning is conceived of as a form of organization.

Monitoring is the self-regulation of one's actions in an activity or task. It involves comparing and evaluating the outcome of action with the expectation or goal of the activity. Monitoring involves checking and commenting on one's own work and that of others. Self-evaluation is the positive or negative assessment of the outcome of one's own behavior, and is the evaluative aspect of monitoring one's own actions.

Accommodation brings the idea of adaptation into the schema. It is behavior in response to the actions of others, or to one's own actions. It does not imply passivity, but rather the ability to adapt to the demands of the situation, and to changes in those demands.

Finally, Outcome, like involvement, is outside the system of action because it is an event in the external world, not a process. In the course of any activity there are innumerable small outcomes, but the one we are primarily concerned with is the endpoint of a sequence of behavior, the completion and success of an activity. Evaluation of one's actions by others is also an outcome; in the school context, evaluation by peers and teachers contributes significantly to young children's definition of success and mastery, or failure and ineptitude. Outcome of action is linked to motivation, and thence to involvement as the feedback mechanism in the schema.

Children's strategies are recorded under each of these five constructs. Social strategies are differentiated from strategies with objects, or "mastery" activities, though an overlap is obviously possible (e.g., two children working on a puzzle).

Social Strategies: These are the strategies that occur when the child is interacting in purposeful activity with one or more other people.

Mastery Strategies: These are the strategies a child uses when engaged in a purposeful task with objects. The task may be a solitary activity or one undertaken with one or more others. It is often a problem-solving activity. It always has a known or observable goal whose achievement in terms of completion and success is observable.

An overview of the social and mastery strategies recorded in the CSAS is presented in Figure 1, grouped according to the five constructs.[1] As indicated, items with an asterisk can have both positive and negative aspects. Where relevant, a record is also made of whether a strategy is accepted, rejected, or ignored.

In a few instances, social and mastery strategies are identical, e.g., Physical Setup, under PLANNING. In a few others, they are parallel, e.g., Invokes Rules (Social PLANNING) and Verbalizes Rules or Task Requirements (Mastery PLANNING). By and large, however, social strategies and mastery strategies are different, reflecting the different behavioral demands and conventions in these two domains.

The Structured Task: Animal Stalls

We developed a structured task, Animal Stalls, which allows us to achieve more control by providing a "standard" format and a situation designed to evoke mastery strategies. The procedure is that a model block construction is shown to the child, an assortment of blocks and accessories is provided, and the child is asked to make a construction just like the model. The Animal Stalls are made of natural wood table blocks and there is a two-stall, a three-stall, and a six-stall model for children aged three to six. The increase in the number of stalls is matched by increase in the complexity of a superstructure of arches. Miniature animals and bales of hay are housed in each stall, and a few additional miniature animals are placed outside the front of the structure(s). The three-stall model is shown in Figure 2. The Animal Stalls was administered to 75 children, of whom 50 were in urban or rural Head Start programs, 10 in private preschools, and 15 in public kindergartens. This task went through several developmental phases. In spite of considerable experience with children's block constructions both in classrooms and in other research, it was not a simple matter to assess the difficulty of the construction task.

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[1] These strategies are more explicitly defined, with behavioral examples, in the manual for the CSAS (Bronson, Shapiro, Wallace, and Desir, 1982).

Figure 1. Concepts and Strategies in Social Interaction and Mastery Tasks.

Concept	Strategies	
	Social	Mastery
INVOLVEMENT	Collaborative Interaction Noncollaborative Interaction Socializing Involved Watching Not Involved Other	On Task Explores Distracted Attends to Instructions
PLANNING	*Physical Setup Predicts Outcome Suggests Activity/Demonstrates/ Directs Assigns Roles or Resources Invokes Rules *Request to Join	*Physical Setup Predicts Outcome Verbalizes Rules or Task Requirements *Uses Systematic Approach
MONITORING	Monitors Others *Describes or Comments on Others *Describes or Comments on Self	Checks Instructions or Model Describes or Comments on Work Comments on Ease or Difficulty of Task
ACCOMMODATING	*Shares *Trades or Trades Off *Takes Turns *Promises/Bribes *Helps *Joint Effort or Combines Resources Hostile Force Resists Rules or Teacher Asks Social Help	*Revises Action or Takes New Approach Fine Tunes Asks Mastery Help
OUTCOME		
Completion		Completes Incomplete Not Applicable
Success		All Perfect Nearly Perfect About Half Less than Half Right
Evaluation	Praised Criticized Corrected Ignored	

*Strategies with an asterisk have both positive and negative aspects.

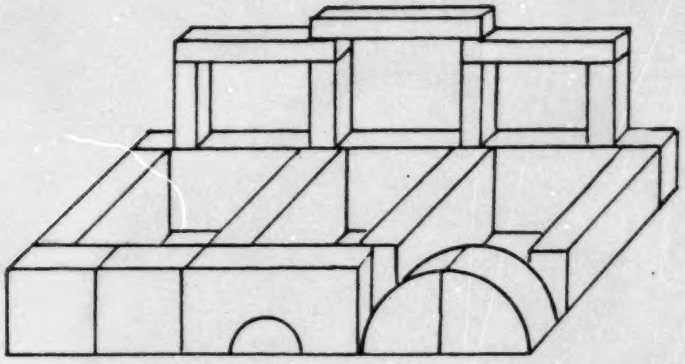

Figure 2. Animal Stalls: Three-Stall Model with Arch Superstructure. (Animals and hay bales are distributed in each stall and in front of the models)

All children were tested individually in an area separate from the child's classroom. The interviewer had already constructed the model(s) and laid out the materials for the child to use. All children were tested in their preferred or dominant language.

Findings.

The children's response to the Animal Stalls task was generally positive; only a few were unable to tackle it. Most seemed to enjoy the process even though it was apparent that the request to "make one just like mine" was not one that they were used to.

The outcome of the construction process was analyzed to yield a Completion Success Index (CSI: the number of items correctly placed ÷ the total number of items in the model). Protocols were sorted into five categories, in which accuracy weighed heavily but was not the sole criterion.[1]

The top group (17%) made constructions that were all perfect or nearly perfect

Children in the second category made constructions that bore a close resemblance to the model, but had a conspicuous omission, addition, or reversal. Those in the third category (23%) made structures that were recognizably like the model but always included significant omissions, additions, substitutions, or unconnected parts. The fourth group (37% of the children) contains the broadest variation in type of structure, and what they built bore no clear resemblance to the model.

Finally, there was a group of children (11%) who essentially could not cope with the demands of the task.

Teacher ratings. The children's classroom teachers were asked to rate the sample children on a series of questions culminating in an overall assessment of the child's general competence in social situations and on school-related tasks. The teacher ratings serve as a useful external criterion of children's effective

[1]Two of the authors (Shapiro and Wallace) defined the categories and sorted the protocols independently; disagreements were discussed and a concensus reached in each case.

functioning in the school situation, but are not a measure of the validity of the Animal Stalls procedure, or of our categories. Nevertheless, there is an association between the ratings given by the teachers and the outcome categorization. None of the children in the top two categories was given a low rating, and none in the lowest category was rated high.

Strategies Used and Their Relation to Outcome.

There was a great deal of variation in the amount of time taken within each outcome category group. Those least able to cope with the task spent the least amount of time on it. In general, however, time taken is not associated with effectiveness of performance.

Involvement is an indicator of motivation and, by and large, the children were rated as on task most of the time (76%). Being on task is a necessary but not sufficient condition for effective performance. A high percentage of time on task characterizes children who successfully replicated the model.

Planning Strategies indicate the child's organization of purpose. The relation between the sheer frequency of planning strategies and the outcome categorization is striking: a high frequency of planning strategies is associated with effective outcome. When the child makes a construction in an organized way, s/he is coded as using a systematic approach. The child may be proceeding systematically even when the end result is quite different from the model. (The negative of this strategy is not incorrectness, but evidence of being disorganized.) The relation between the use of a systematic approach parallels the outcome categories, that is, more effective builders are more systematic. The application of system contributes most to the planning construct, and is clearly associated with effective performance.

Monitoring Strategies, like planning strategies, are also associated with effectiveness of perfcrmance. Monitoring one's performance is essential in any

task and is especially critical when the task requires coordination with an external model. All the children examined the model at the beginning of the task, even those who built structures totally different from it. Checking the model during construction is crucial to effective performance.

Accommodating to the demands of the task and of the materials is, of course, an integral feature of any activity. What we are able to observe, however, are the kinds of accommodative strategies that are, as it were, writ large. Accommodating strategies occur much less often in the Animal Stalls situation than do either planning or monitoring strategies.

In sum, the Animal Stalls task offers a viable method for evoking strategic behavior. Since, as we have said, the task is new to the children, they are accordingly transferring their strategic skills. We have found that using outcome as a kind of "sorting" device is a useful way to identify the constituents of competence. The use of planning and monitoring strategies is convincingly associated with effectiveness, and highlights the importance of these strategies for competent performance. Observing the difficulties some children had enhanced our awareness of the task's complexity and the broad range of capabilities that effective performance demands. Developmental variables obviously play a significant role, but the relationships are neither simple nor clearcut. We have seen young three-year-olds skillfully building the 3-stall model, and five-year-olds who cannot build the 2-stall. Perhaps it should also be noted that no stereotypical expectations about differences between girls and boys in a task that required building with blocks were confirmed. Girls were just as likely as boys to build excellent models; boys were just as likely as girls to flounder.

Work in Progress: Preliminary Findings

As we have already said, the CSAS is designed to be a tool for observing strategic behavior in both the natural classroom setting and in a structured task.

Early observation in classrooms was an important source for developing category definitions and scoring conventions. As the CSAS was refined and stabilized, it became possible to tackle the larger question of the relation between the strategies used in the classroom and in the more contrived task situation.

A sample of 45 four- and young five-year-olds is being observed in the classroom and in the Animal Stalls situation; teachers' ratings of the children's competence in social and school-related mastery competence are also being collected.

In the classroom, the children spend much more time in social interaction (about half) than in mastery activities (about one-third). Their social interactions are much more likely to be noncollaborative than collaborative (about 2:1). The strategies they use are overwhelmingly positive both in social (70%) and mastery activities (over 90%). A high level of success is associated with this picture: close to two-thirds of the children's social strategies accomplished their aim, and close to three-quarters of the tasks they undertook are successfully completed. By far, the major proportion of these positive strategies are planning strategies. Monitoring strategies are much less frequent, and accommodation strategies, while common in social situations, are seldom observed in mastery situations.

In the Animal Stalls, planning and monitoring strategies are most frequent, and accommodation strategies are also used only occasionally. (This parallels the pattern found in the larger sample just reported.)

Interestingly, there is a higher degree of success in mastery strategies in the classroom than in Animal Stalls, perhaps because, in the classroom, such strategies are more likely to be tied to familiar or self-selected tasks, and are not accompanied by the stress that might attend the structured task.

A major contrast between the two settings is in the density or rate of strategy use. The Animal Stalls task evokes strategic behavior in a more dense and concentrated way than the more open classroom situation. While perhaps not

surprising, this is reassuring; it is precisely for this reason that we turn to the use of structured situations.

As before, teachers' ratings of the children's mastery competence is highly related to the use of positive strategies and the effectiveness of their performance in the Animal Stalls situation and, not surprisingly, to the children's use of strategies in the classroom.

We have been encouraged by the findings to date. The conceptual scheme, together with the CSAS and the Animal Stalls task, provide an integrated and coherent approach to identifying and measuring important aspects of young children's competence. A major strength of the observational system is its broad scope and its applicability to a wide range of interpersonal and task situations and settings. The system has the potential for focusing on and analyzing specific aspects of child life in school; for example, how children get others to do what they want. It could also be elaborated to further differentiate strategies, especially those we have found most common. Focusing on what children do, how they plan and monitor their activities and accommodate to the demands of the social or task situation offers a fresh perspective on their competence.

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